



## BCT Meeting



# Remedial Action Update

## Parcel B (Excluding IR Sites 7 & 18)

August 29, 2013





# Presentation Overview



- **Durable Covers Implementation Update**
- **SVE System Startup and Optimization Update**
  1. Maximum Vacuum Tests Results
  2. Step Test Results
  3. Multi-well Configuration Test Results
  4. Constant Rate Test (in progress)
- **RA Schedule Update**
- **RA Photos**



# Durable Covers Implementation Update



## Asphalt Cover Installation

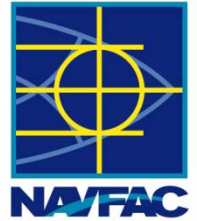
- Asphalt installation 100% complete
- Drainage swales operational

## Well Extensions, Site Security, Site Cleanup, and Demobilization

- Extension of all monitoring wells to new site grades (100% complete)
- Perimeter fence installation (90% complete)
- Perimeter signs and settlement monuments to be installed in late August/ early September
- Closeout inspections to begin on September 3
- Demobilization scheduled for September 6



# SVE System Startup and Optimization Update

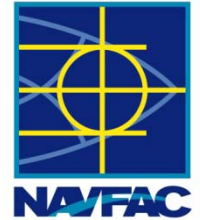


**The Navy is currently completing the optimization tests to achieve efficient SVE system operation. Recall from first Triad meeting:**

- **The four types of startup optimization test performed are:**
  - 1) Maximum SVE (vacuum) tests at all 26 SVE wells
  - 2) Step tests at all 26 SVE wells
  - 3) Multi-well flow field configuration tests
  - 4) Constant rate SVE tests of multiple SVE wells by quadrant (in progress)
- **Data from each test are being used to support the subsequent tests**



## Review: Optimization Objective



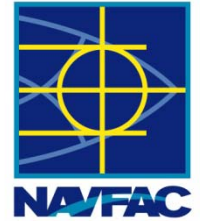
**Objective: To optimize mass removal efficiency during SVE operation**

**Evaluations performed to support meeting this objective, including:**

1. Determining operational limitations due to heterogeneous subsurface lithology and groundwater upwelling
2. Estimating soil permeability and pore volume exchange rate to determine zone of effective air exchange
3. Targeting areas at startup where highest concentrations detected during baseline sampling and reevaluating focus areas as conditions change
4. Determining ideal extraction rates and well configurations to optimize effective ROI
5. Evaluating treatment efficiency (carbon loading and breakthrough rates)



## Review: Startup Optimization Strategy



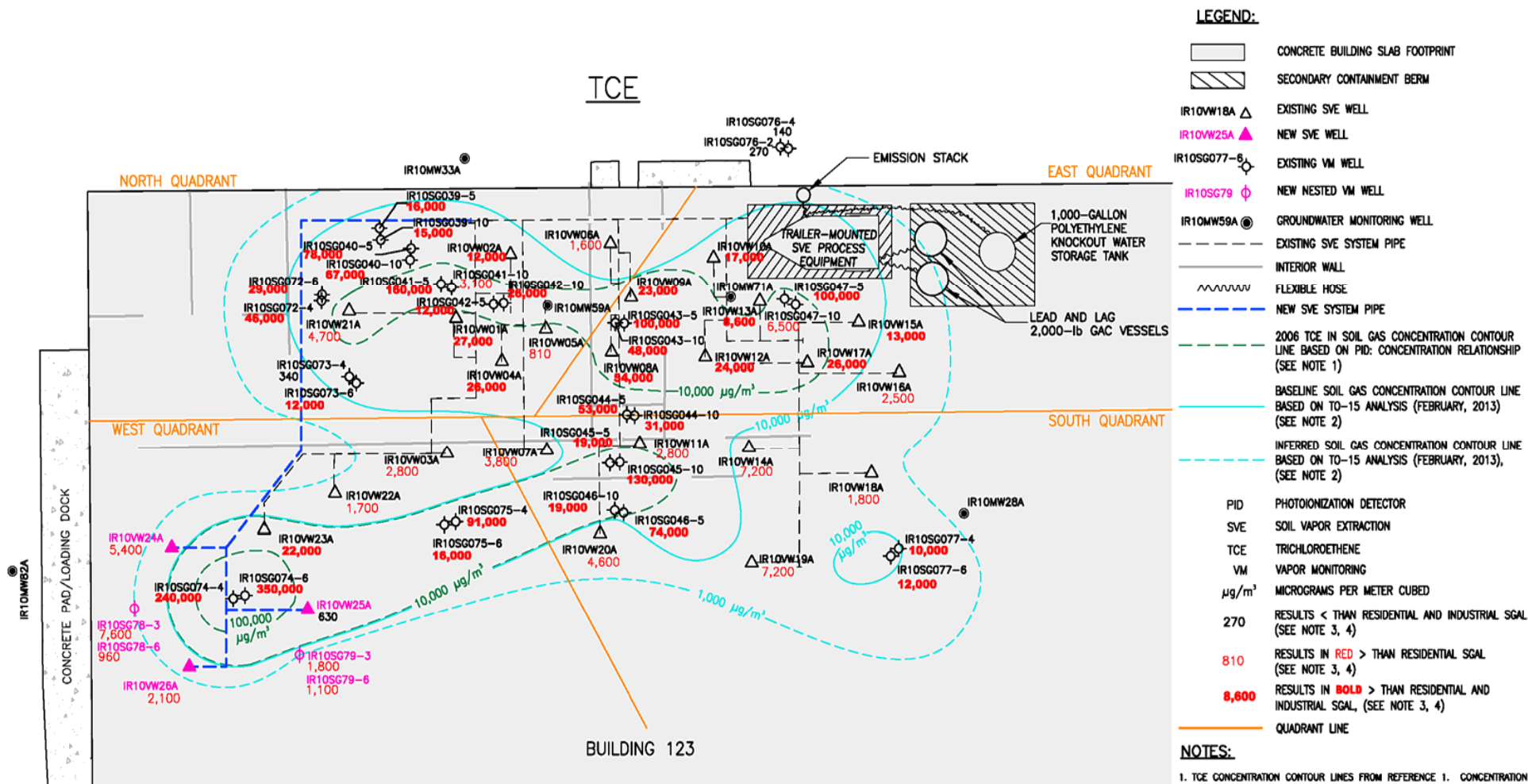
**SVE initially focused on smaller geographic areas to allow for assessment of VOC mass removal efficiency and capture zone size in the most contaminated areas**

- Divided the VOC plume into four quadrants based on baseline data
- Collected data during system startup from each quadrant to evaluate localized SVE effects (e.g., vacuum-to-flow relationship, flow-to-concentration relationship, ROI)
- Strategy allowed for expanding data collection beyond limits of quadrants
- Performing cycling (rotation) of SVE wells between the quadrants (to maximize and focus treatment by area and allow adequate time for rebound/ recovery in each area)



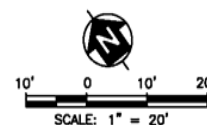


# Review: SVE System by Quadrants



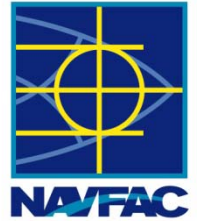
## References:

- ChaduxTt, 2012. "Draft Amendment to Revised Final Design Basis Report for Parcel B (Excluding Installation Restoration Site 7 and 18), Hunters Point Naval Shipyard, San Francisco, California." July 18.
- Innovative Technical Solutions, Inc., 2006. "Final Phase III Soil Vapor Extraction Treatability Study Report, Building 123, IR-10, Parcel B, Hunters Point Shipyard, San Francisco, California." November.
- Sealaska Environmental Services, LLC (Sealaska), 2013. "Final Technical Memorandum Soil Vapor Investigation in Support of Vapor Intrusion Assessment, Parcels B, D-1, G, and UC-2, Hunters Point Naval Shipyard, San Francisco, California." March.





# Results: Optimization Test 1



## (1) Maximum SVE (vacuum) test at all 26 SVE wells:

- Determined upper vacuum and flow limit based on lithologic limitations
  - Upper vacuum limits of all 26 wells ranged between 4" and 6" Hg (similar to historic system data)
- Evaluated groundwater upwelling by monitoring
  - Change in groundwater levels monitored in nearby wells (IR10MW71A, -59A, and 28A) was negligible ( $< 1/100^{\text{th}}$  of a foot)
  - Upwelling observed in 1 of 26 SVE wells (VW13A @ 6.5" Hg of applied vacuum)





## Results: Optimization Test 2

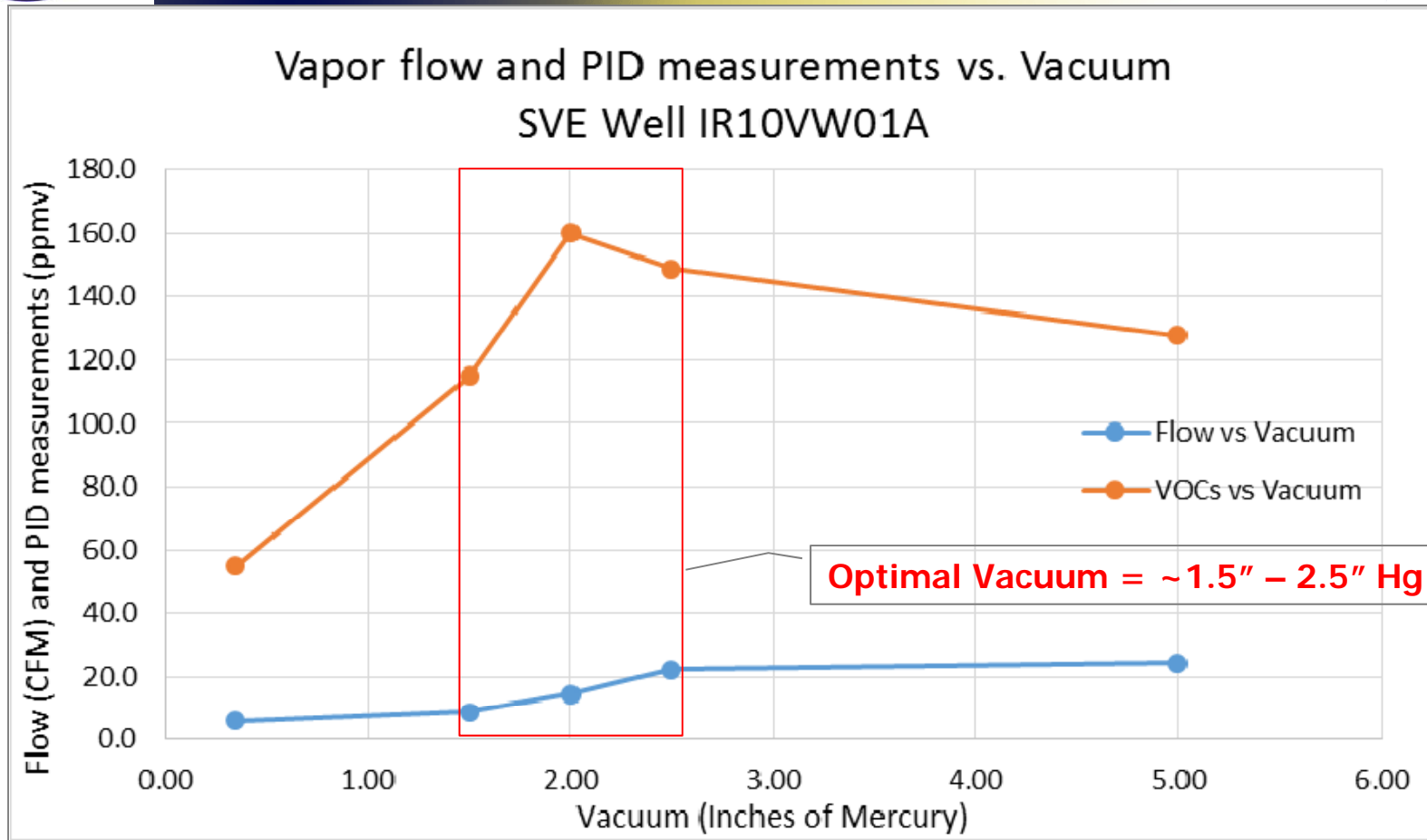


### (2) Step tests at all 26 SVE wells:

- Operated each well at approximately 25, 50, 75, and 100% of maximum vacuum (Test 1) and measured vacuum pressure, vapor flow rate, and relative presence of VOCs (using PID readings)
- Plotted vapor flow rate and relative PID reading vs. applied vacuum to determine optimal operating range (i.e., target vacuum pressure for each well)
- Example step test result for an SVE well on next slide



## Example Step Test Data Evaluation SVE Well VW01A (North Quadrant)



Notes:

1. Blower temperature spike, with extremely turbulent SVE flow above 5.0 "-Hg.
2. Target applied vacuum range: 1.5 – 2.5" Hg



## Results: Optimization Test 3

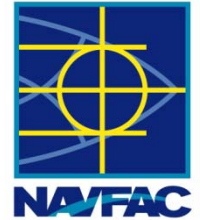


### (3) Multi-well flow field configuration test

- Evaluated four well configurations (to target four quadrants delineated based on baseline data)
- Discovered that blower capacity allows for targeting two quadrants simultaneously at next to optimal operating conditions
  1. Operated East and West Quadrants simultaneously
  2. Operated North and South Quadrants simultaneously
- Evaluated passive air diffusion (open VM wells to enhance SVE system VOC mass removal)
  - No measurable increase in PID measurements at system influent
  - Results inconclusive at this time, presumably because VOC concentrations are still relatively high
  - Passive air diffusion retained as viable option for improving recovery; currently being implemented in the West quadrant



# Optimization Test 4 Summary

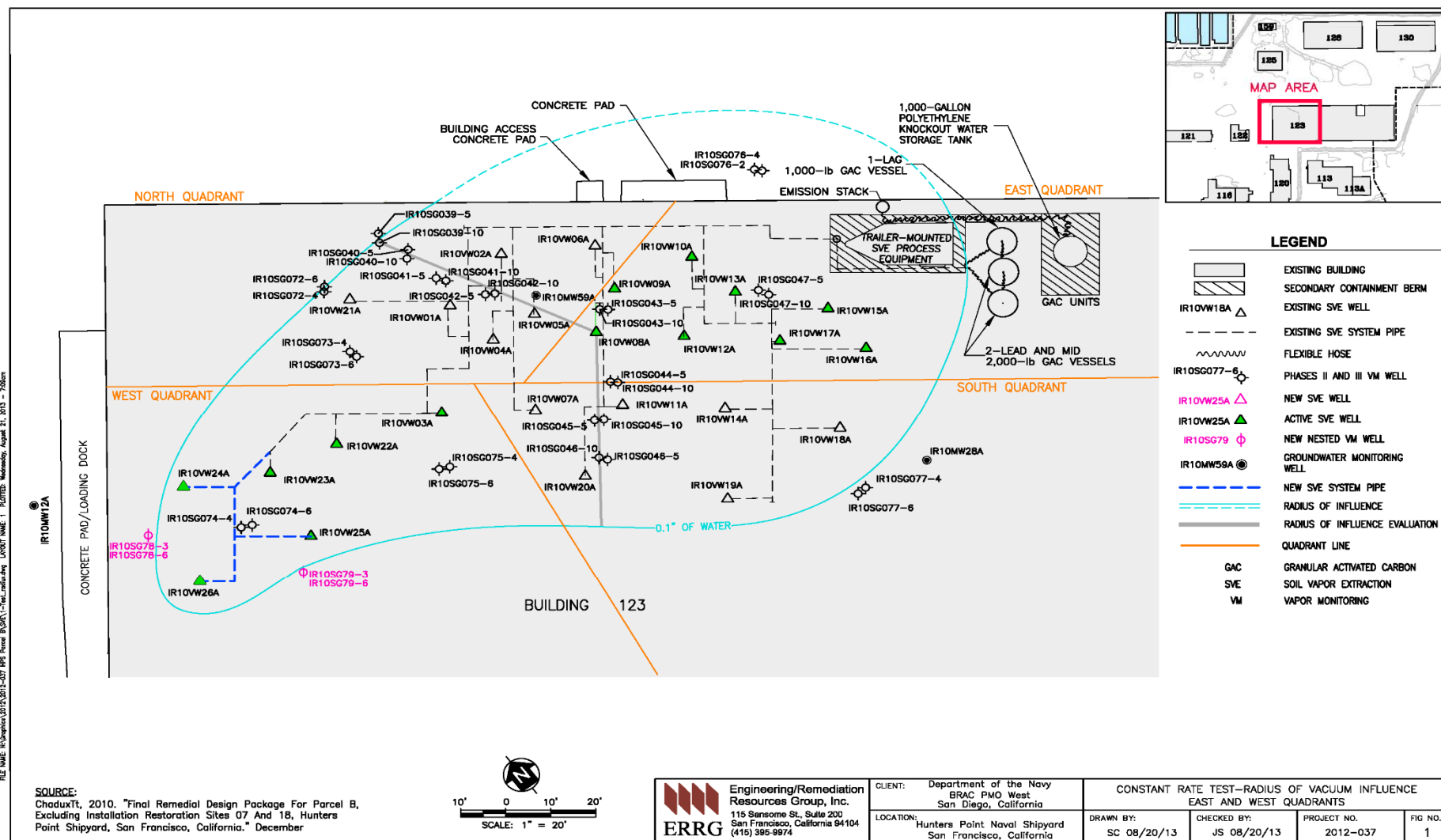


## (4) Constant rate SVE tests

- Operated SVE wells in East and West quadrants simultaneously for first constant rate test (based on results of Test 3)
- System operated for 13 consecutive days
- Measured ROI (defined as vacuum to 0.1" of H<sub>2</sub>O) following stabilization of multi-well flow field
- Performed periodic TO-15 sampling and PID monitoring of SVE system granular activated carbon (GAC) vessels influent, midstream, and effluent to evaluate mass removal, treatment efficiency, and ensure compliance with BAAQMD discharge requirements
- Currently performing constant rate test in North and South quadrants simultaneously. Based on preliminary results, expanded well flow field to include a portion of the West quadrant.

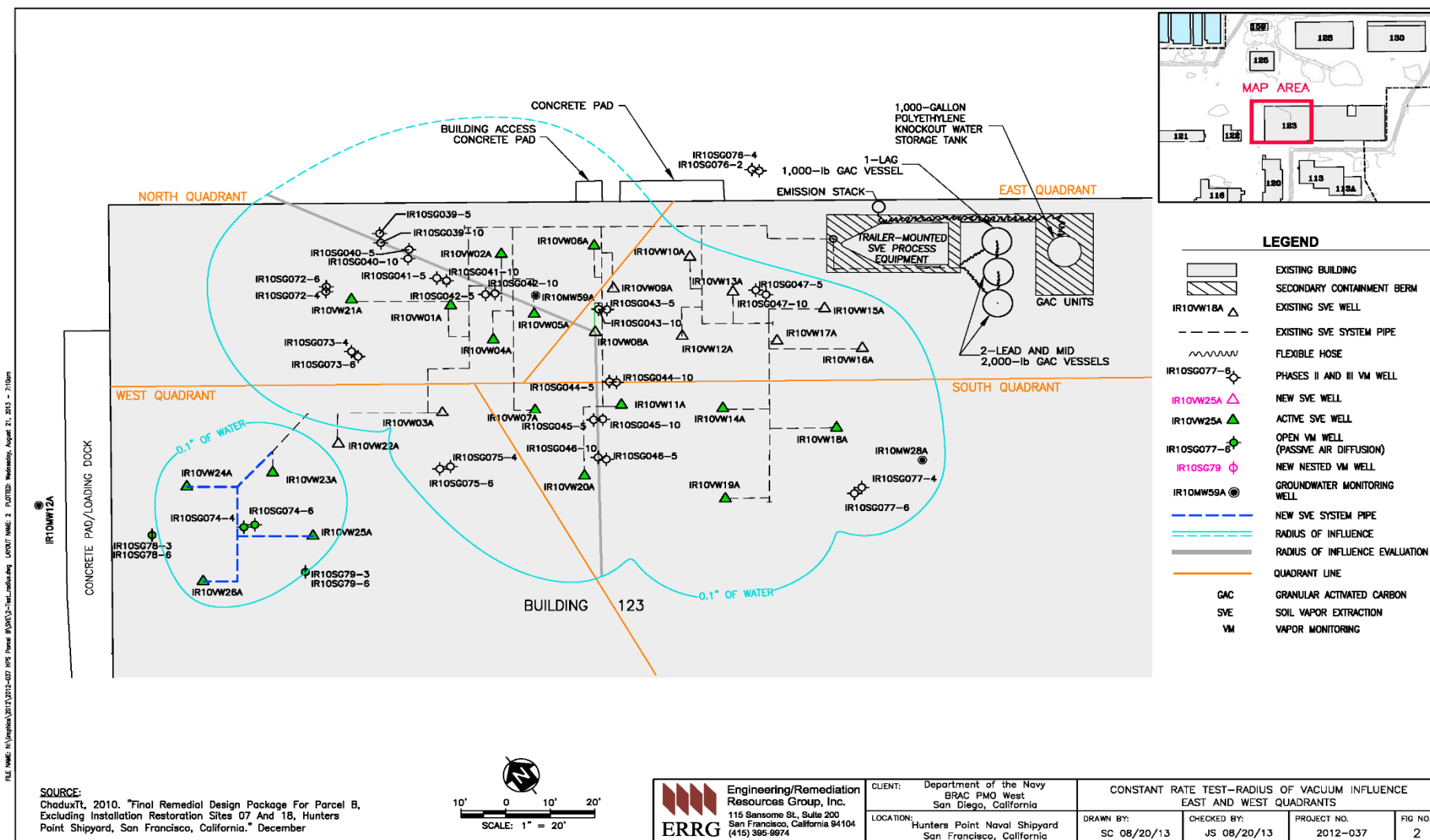


# ROI Estimated by Constant Rate Test East and West Quadrants





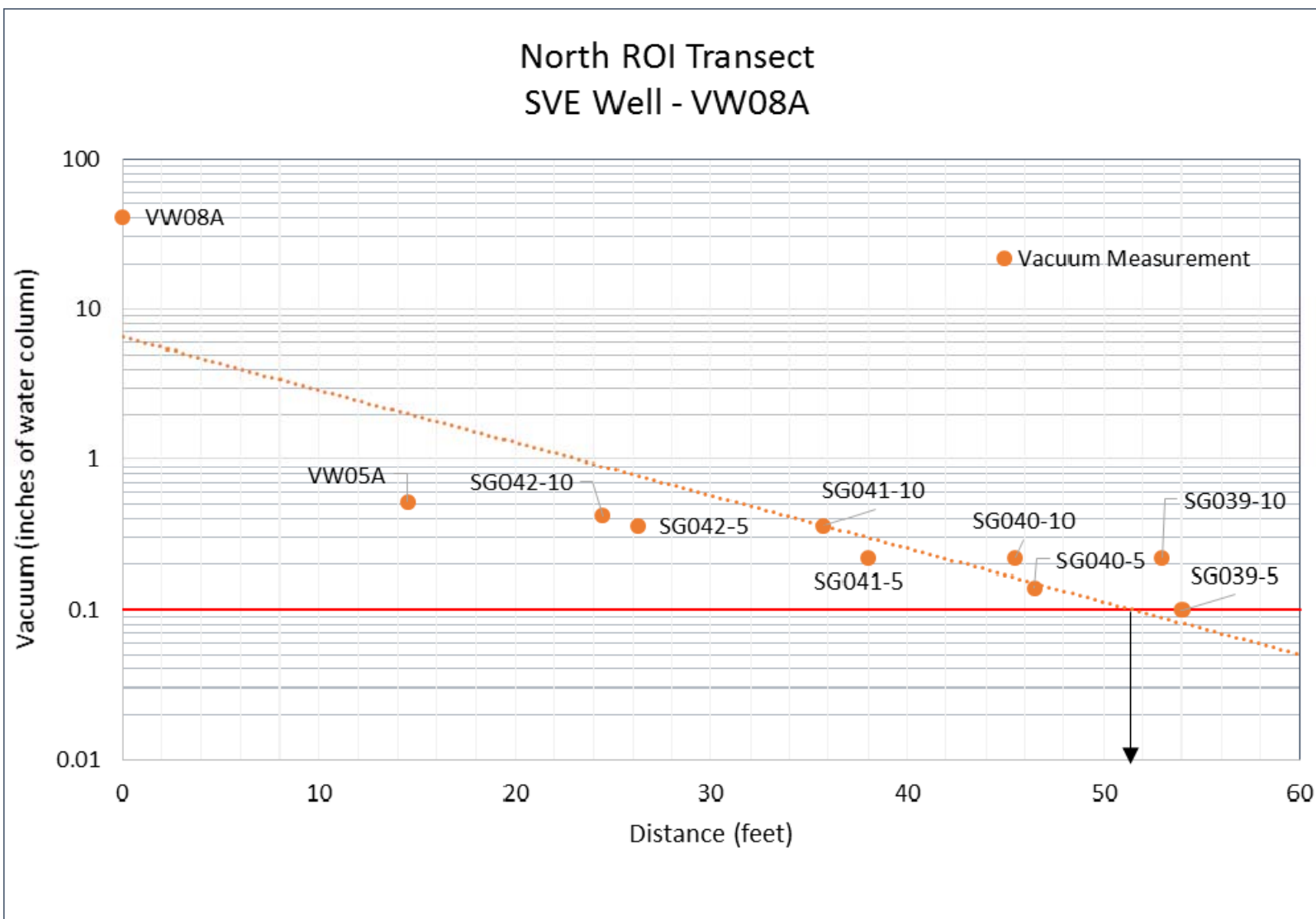
# ROI Estimated by Constant Rate Test North, South, and West Quadrants





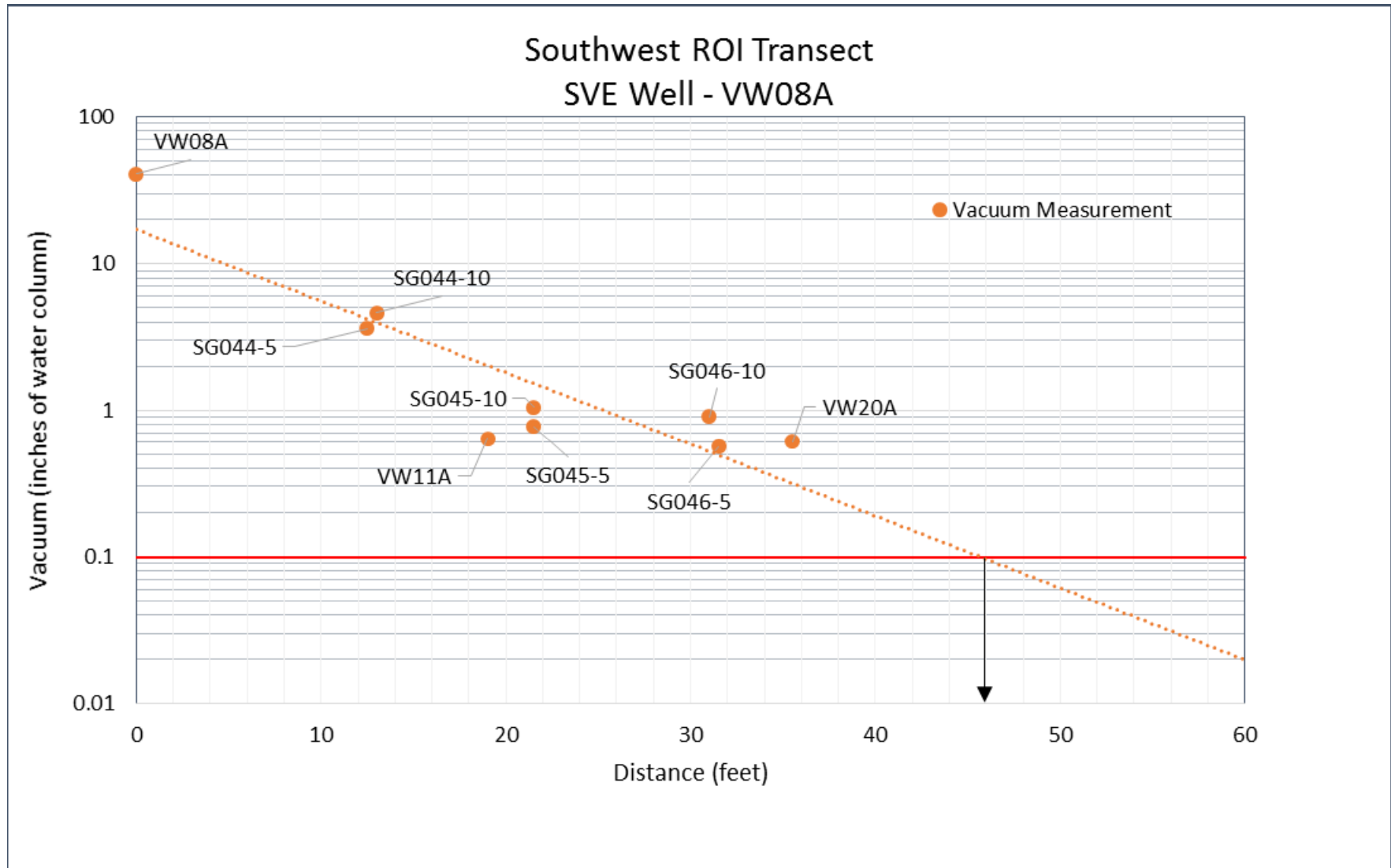


# Constant Rate Test East and West Quadrants





# Constant Rate Test East and West Quadrants





# Treatment System Performance

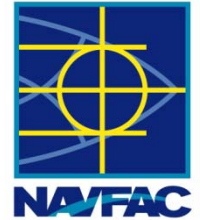


Date	Hours of Operation	Influent TCE Conc. ( $\mu\text{g}/\text{m}^3$ )	Influent Total VOC Conc. ( $\mu\text{g}/\text{m}^3$ )	Effluent TCE Conc. ( $\mu\text{g}/\text{m}^3$ )	Effluent Total VOC Conc. ( $\mu\text{g}/\text{m}^3$ )	Removal Efficiency (%)	Influent VOC Removal Rate* (lbs/day)
7/16/13	22.1	7,700	8,060	38	39	99.52	0.169
7/18/13	41.6	5,000	5,060	21	22	99.56	0.116
7/22/13	119.3	18,000	18,762	1.1	3.7	99.98	0.487
8/1/13	139.6	6,400	6,400	1.6	3.6	99.94	0.152
8/7/13	173	13,000	13,050	1.4	1.4	99.99	0.313

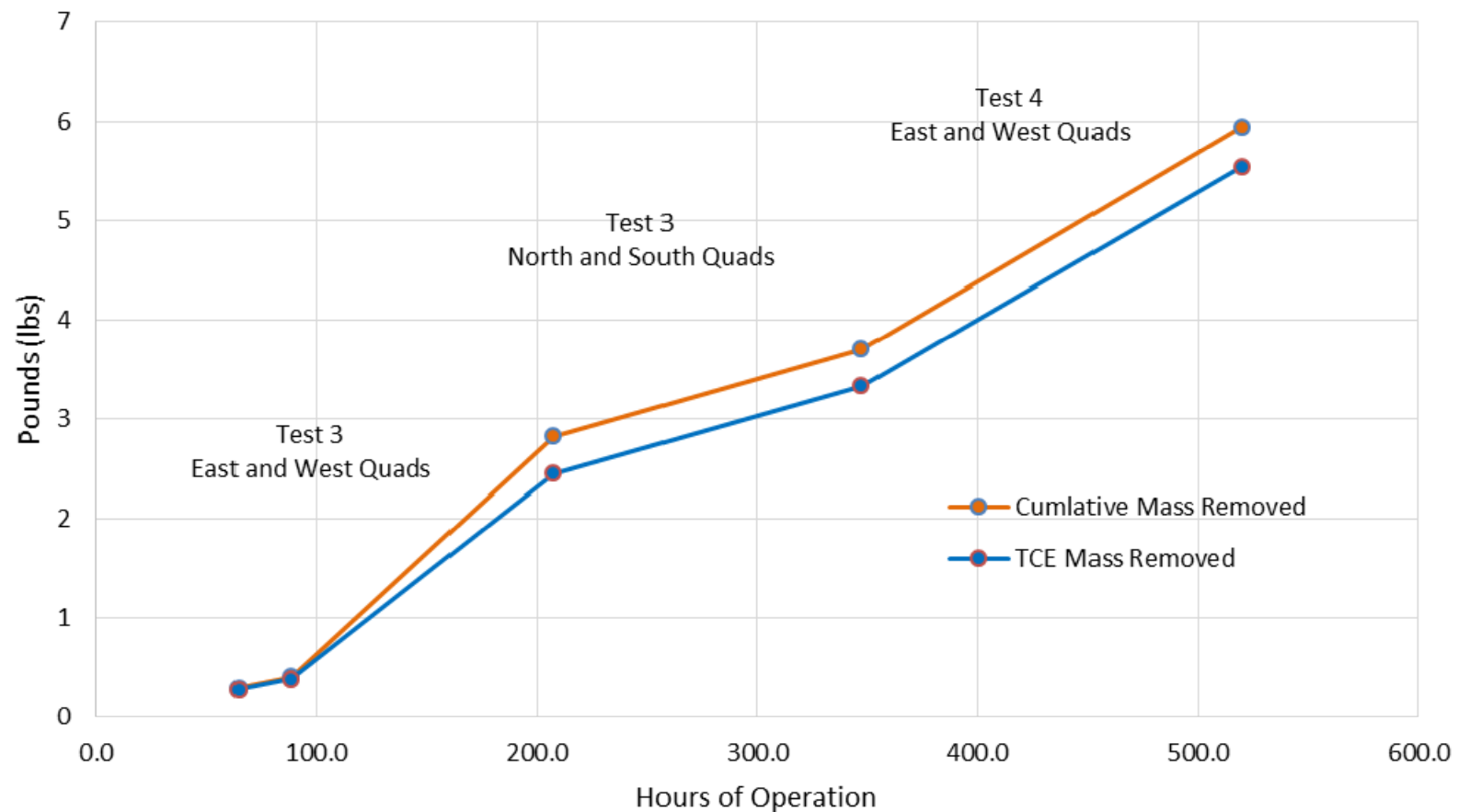
**\*Note:** Per BAAQMD regulations, the trigger for using abatement devices (e.g., GAC) is 1 lb. per day total VOCs.



# Cumulative Mass Removed to Date

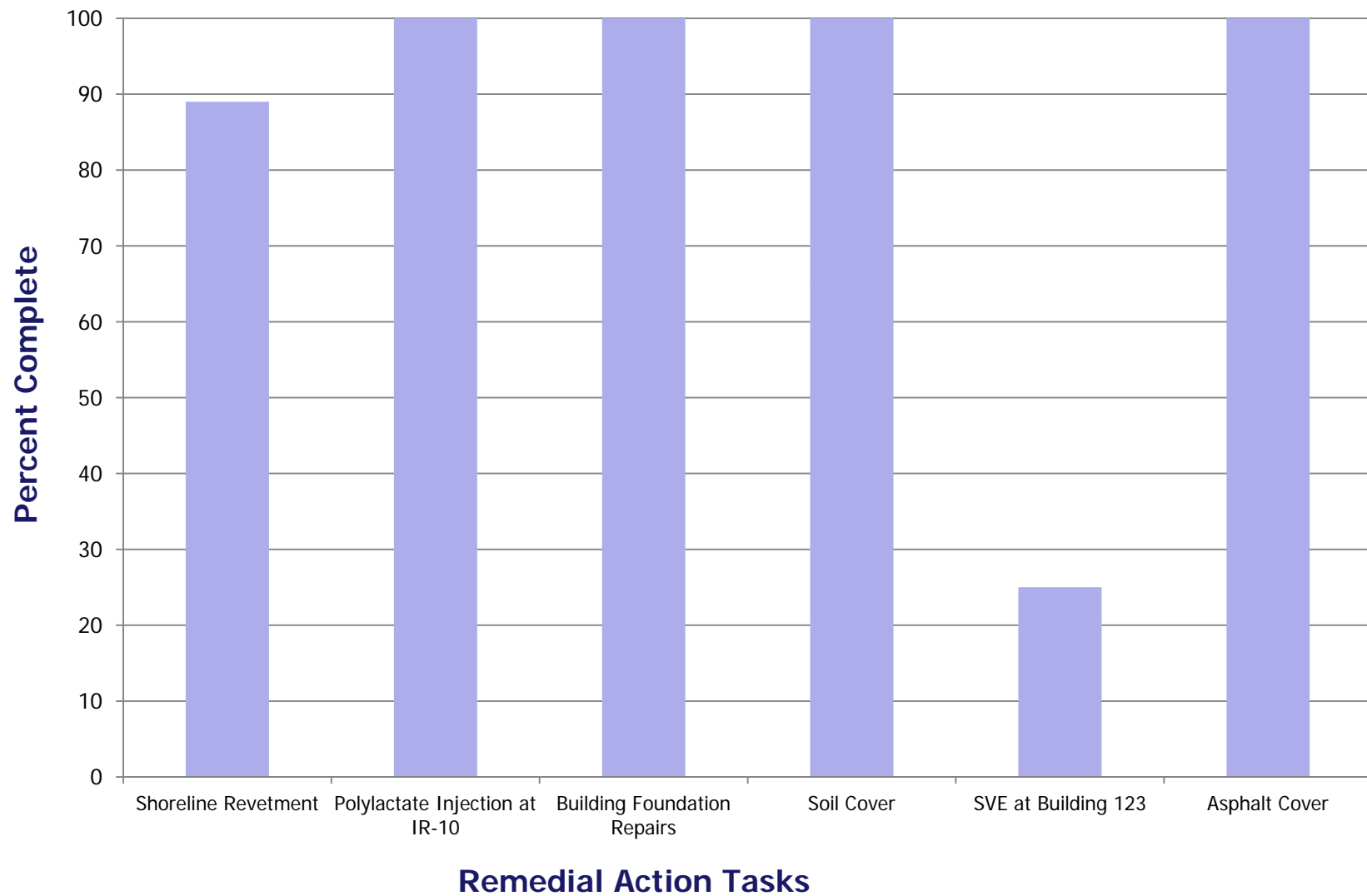


Cumulative Mass Removed  
Total VOCs and TCE by TO-15 Analysis



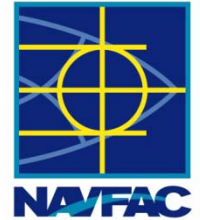


## RA Implementation Update





## RA Schedule Update



### Construction Schedule

- |   |                             |
|---|-----------------------------|
| • Mobilization and Site Preparation:              | Nov 5, 2012 – Nov 12, 2012  |
| • Revetment Construction:                         | Nov 12, 2012 – Jan 17, 2013 |
| • Polylactate Injection:                          | Feb 22, 2013 – Mar 3, 2013  |
| • Foundation Inspections and Repairs:             | Jan 17, 2013 – May 5, 2013  |
| • SVE System Setup and Operation:                 | Mar 4, 2013 – TBD           |
| • Soil Cover Installation:                        | Feb 22, 2013 – Jun 4, 2013  |
| • Grading:  | May 6, 2013 – July 5, 2013  |
| • Asphalt Cover Installation:                     | July 8, 2013 – Aug 9, 2013  |
| • Fence, Sign, Settlement Monument Installation:  | Aug 10, 2013 – Sep 3, 2013  |
| • Site Cleanup, Final Survey, and Demobilization: | Aug 21, 2013 – Sep 6, 2013  |
| • Revetment Construction at Combined Sites:       | TBD                         |
| • RACR  | TBD                         |





## Asphalt Cover Installed Near Dry Dock 3/Building 140





## Asphalt Cover Installed Near Sub Pens and 7/18





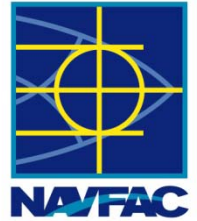
## McCann Street Paved and New Curbs Installed







## Asphalt Cover Installed Around Pump House Outfall





## Revetment Crest Completed to Tie Into Asphalt Cover







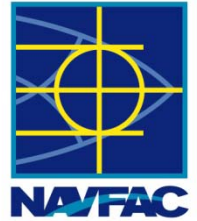
## Revetment Crest Completed to Tie Into Asphalt Cover







## Unfinished Revetment at Combined Site Paved To Revetment Crest







## Soil Cover Vegetation Establishment Underway





## Fence Post Installation and Monitoring Well Extension







## Completed Fence Along B/C Boundary

